# A METHOD FOR CONVERTING DRY MOUNTS OF MIDGES (DIPTERA: NEMATOCERA) INTO SLIDE MOUNTS[1]

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ABSTRACT: Insects such as midges, preserved dry and glued to points or to insect pins, may be converted into permanent slide mounts by first soaking in relaxing fluid followed by a passage through a series of alcohols and beechwood creosote and mounting in diaphane. Air may be removed from specimens by the application of heat. The method may be used also for immatures or adults which have dried out.

DESCRIPTORS: Ceratopogonidae, Chironomidae, Diptera, midges, mounting, Nematocera, preservation, technique.

Fragile insects such as midges are particularly difficult to preserve indefinitely. The necessity for detailed study of genitalia presents a special problem. Preservation in fluid makes possible the examination of specimens from all angles, but such specimens inevitably suffer damage and loss of parts as a result of direct manipulation. Furthermore, color and certain surface and wing features are likely to be lost. On the other hand, the study of genitalia on dry specimens is particularly difficult. Ideally specimens of a given species when collected should be processed in 2 ways: (1) glued to points on pins and kept in the dry state and (2) placed in vials containing fluid, later to be mounted on slides. Dry mounts and slide mounts are not subject to direct manipulation and are therefore likely to have a longer life than specimens in fluid. Thus the advantages of developing a simple method for converting dry mounts into slide mounts are obvious. Although to date tested only on Chironomidae and Ceratopogonidae, the basic procedure detailed here should have rather wide application.

The method which follows is applicable particularly to insects such as midges mounted on points with white shellac, cellulose nitrate, cellulose acetate, clear nail polish, or various commercial glues. As indicated below, it may be used with slight modification for specimens mounted on minuten nadeln. Certain chemicals,

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including xylene, formalin, and potassium hydroxide, destroy features such as body color of adults and eyespots of larvae and are deliberately avoided.

### Details of the Method

**Step 1.** Submerge the specimen in a fluid having the following ingredients: 45 parts 95% ethyl alcohol, 5 parts benzene, 15 parts ethyl acetate, and 35 parts distilled water. This is similar to Barber's fluid (Borror and DeLong 1971) and will subsequently be referred to as relaxing fluid. Pointed specimens may be slipped to the top of the pin and then submerged by angling the pin from a standard insect pin holder. The relaxing fluid may be contained in a small stender dish. If the specimen in the fluid is released, proceed to step 4; otherwise allow to soak about an hour and then proceed to step 2.

**Step 2.** Without removing the specimen from the dish, change the fluid by alternately pipetting off fluid and adding ethyl acetate. Specimens lightly attached are quickly released. Heavily glued insects may remain attached. In the latter case, after about an hour, use a fine dissecting needle and, by applying the needle to the soft glue rather than to the specimen, tease off the specimen in the fluid. Do not try to remove glue from the specimen. Glue tends to separate in step 8 and may then be removed before applying the cover slip.

**Step 3.** By alternately pipetting off ethyl acetate and adding relaxing fluid, change the fluid back to relaxing fluid. Allow to soak at least 10 minutes.

**Step 4.** Examine the specimen under a dissecting scope. If air bubbles are present, proceed to step 5; if absent, to step 6. All specimens that float should be subjected to step 5.

**Step 5.** Cover the dish containing the specimen loosely with a glass plate. Using an infrared lamp, apply heat to the fluid until the specimen moves in the fluid. Generally a lamp held about 4 or 5 inches above the dish provides enough heat to eliminate air bubbles in about 5 minutes. Remove the lamp if the specimen moves violently. Examination of the insect after the medium has cooled should determine whether all objectionable air has been eliminated.

**Step 6.** Using the same means as in step 2, change the fluid in the dish to 95% ethyl alcohol. After about 5 minutes, change to absolute alcohol. Allow to soak at least 10 minutes.

**Step 7.** Pipette off as much alcohol as possible without causing the specimen to lose the support of the fluid. Then add beechwood creosote. Allow to soak overnight.

**Step 8.** Mount the specimen on a glass slide in diaphane. Details of the mounting process have been published previously (Boesel and Vaughn 1951) and need not be repeated here.

## Discussion

The procedure described here is particularly useful in managing dry specimens for which genitalia mounts are desired. The genitalia should be removed only after the specimen has been placed in diaphane on the slide. Loss of genitalia then is virtually impossible.

In the case of dry specimens impaled on minuten nadeln, steps 2 and 3 should of course be omitted. After soaking in relaxing fluid the insect is readily pushed off the point.

Prolongation of the period of submergence in relaxing fluid, ethyl acetate, or creosote has no appreciable bleaching effect on specimens. In general, time allotted in the directions to the various soaking periods may be considerably shortened, particularly for smaller specimens. For example, specimens allowed to remain in creosote only until they sink are presentable. Some sink in 15 minutes or less.

Specimens mounted on celluloid points must be treated with caution for the point will soften and collapse in step 1. Should the celluloid tend to enclose the specimen it should not be disturbed for it will be removed in step 2.

The method is applicable for the recovery of adults or immatures which have been preserved in fluid but have dried out. In that case, steps 2 and 3 should be omitted.

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